

## WHAT IS CLAIMED IS:

1. A signal transmission system comprising:
  - 5 a first transmission means for distributing and transmitting a downward optical signal transmitted by a downward signal transmitting means to a plurality of downward signal receiving means;
  - 10 a second transmission means for multiplexing a plurality of upward optical signals applied thereto and transmitting the plurality of upward optical signals multiplexed, and for distributing and transmitting a downward signal applied thereto;
  - 15 an information transmitting means for transmitting an optical signal that carries specific information;
  - 20 a first WDM means for applying the plurality of upward optical signals multiplexed and transmitted thereto by said second transmission means to an upward signal receiving means, and for applying the optical signal transmitted by said information transmitting means, as a downward optical signal, to said second transmission means;
  - 25 a plurality of upward signal transmitting means each for transmitting an upward signal;
  - 30 an information receiving means for receiving an optical signal that carries specific information; and a second WDM means for applying a plurality of upward optical signals transmitted by said plurality of upward signal transmitting means to said second transmission means, and for applying the optical signal from said information transmitting means transmitted thereto by said second transmission means to said information receiving

means.

2. The signal transmission system according to Claim 1, wherein said information transmitting means is a video signal transmitting means for transmitting the optical signal based on a video signal.

3. The signal transmission system according to Claim 1, wherein said information transmitting means is a data signal transmitting means for transmitting the optical signal based on a data signal.

4. The signal transmission system according to Claim 1, wherein the optical signal transmitted by said information transmitting means has a wavelength longer than those of the plurality of optical signals transmitted by said plurality of upward signal transmitting means.

5. A signal transmission system comprising:  
20 a downward signal transmitting means for transmitting a downward optical signal;  
a first transmission means for distributing and transmitting a downward optical signal applied thereto;  
a second transmission means for multiplexing a  
25 plurality of upward optical signals transmitted by a plurality of upward signal transmitting means and for transmitting the plurality of upward optical signals multiplexed;  
an information transmitting means for transmitting an  
30 optical signal that carries specific information;

a first WDM means for applying the downward optical signal transmitted by said downward signal transmitting means and the optical signal transmitted by said information transmitting means to said first transmission means;

an information receiving means for receiving an optical signal that carries specific information; and

a second WDM means for applying the downward optical signal distributed and transmitted thereto by said first transmission means to a plurality of downward signal receiving means, and for applying the optical signal from said information transmitting means transmitted thereto by said first transmission means to said information receiving means.

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6. The signal transmission system according to Claim 5, wherein said information transmitting means is a video signal transmitting means for transmitting the optical signal based on a video signal.

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7. The signal transmission system according to Claim 5, wherein said information transmitting means is a data signal transmitting means for transmitting the optical signal based on a data signal.

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8. The signal transmission system according to Claim 5, wherein the optical signal transmitted by said information transmitting means has a wavelength longer than those of the plurality of optical signals transmitted by said plurality of upward signal transmitting means.

9. A signal transmission system comprising:

a first transmission means for distributing and transmitting a downward optical signal transmitted by a 5 downward signal transmitting means to a plurality of downward signal receiving means;

a second transmission means for multiplexing a plurality of upward optical signals transmitted by a plurality of upward signal transmitting means and 10 transmitting the plurality of upward optical signals multiplexed, and for distributing and transmitting a downward optical signal applied thereto;

an information transmitting means for transmitting an optical signal that carries specific information;

15 a WDM means for applying the plurality of multiplexed upward optical signals transmitted by said second transmission means to an upward signal receiving means, and for applying the optical signal transmitted by said information transmitting means, as a downward optical 20 signal, to said second transmission means; and

an information receiving means for receiving an optical signal that carries specific information, said second transmission means transmitting the optical signal from said WDM means to said information receiving means.

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10. The signal transmission system according to Claim 9, wherein said information transmitting means is a video signal transmitting means for transmitting the optical signal based on a video signal.

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11. The signal transmission system according to Claim 9, wherein said information transmitting means is a data signal transmitting means for transmitting the optical signal based on a data signal.

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12. The signal transmission system according to Claim 9, wherein the optical signal transmitted by said information transmitting means has a wavelength longer than those of the plurality of optical signals transmitted by 10 said plurality of upward signal transmitting means.

13. A signal transmission system comprising:  
a downward signal transmitting means for transmitting a downward optical signal;  
15 a first transmission means for distributing and transmitting a downward optical signal applied thereto;  
a second transmission means for multiplexing a plurality of upward optical signals transmitted by a plurality of upward signal transmitting means and for 20 transmitting the plurality of upward optical signals multiplexed;  
an information transmitting means for transmitting an optical signal that carries specific information;

25 a WDM means for applying the downward optical signal transmitted by said downward signal transmitting means and the optical signal transmitted by said information transmitting means to said first transmission means; and

applied thereto from said WDM means to said information receiving means.

14. The signal transmission system according to Claim  
5 13, wherein said information transmitting means is a video  
signal transmitting means for transmitting the optical  
signal based on a video signal.

15. The signal transmission system according to Claim  
10 13, wherein said information transmitting means is a data  
signal transmitting means for transmitting the optical  
signal based on a data signal.

16. The signal transmission system according to Claim  
15 13, wherein the optical signal transmitted by said  
information transmitting means has a wavelength longer than  
those of the plurality of optical signals transmitted by  
said plurality of upward signal transmitting means.